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October 31, 1996

96-RF-06211
96-RM-ER-0140-DOE

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LTR. NO.

96-RF-06211

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FINDLEY, M.		
JIERREE, C.		
McANALLY, J.		
PARKER, A.		
POWER, A.		
ZEILE, H.		
BROUSSARD, M	X	
CIRILLO, R	X	X
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RF-46469(Rev.9/92)

John Rampe
ES&H Program Assessment
DOE/RFFO

TRANSMITTAL OF THE QUARTERLY STATUS REPORT FOR THE CONSOLIDATED WATER TREATMENT FACILITY - AMT-086-96

Action: Forward copies of the Quarterly Status Report to the Colorado Department of Public Health and Environment and the Environmental Protection Agency

Rocky Mountain Remediation Services is pleased to deliver the attached copy of the Quarterly Status Report for work package B891 Groundwater Treatment Facility,[1] in fulfillment of the scheduled milestone due October 31, 1996. The task includes operations, maintenance and reporting activities for the Consolidated Water Treatment Plant.

If there is any additional information you would like to have incorporated into the existing format for next quarter's report or clarification of the current report, please do not hesitate to contact J.R. (Russ) Cirillo on extension 5876 or digital page 4011.

John E. Tyson for
Ann M. Tyson
Vice President
Environmental Restoration Projects

JRC:aew

Orig. and 1 cc - J. Rampe

Attachment:
As Stated

cc:
T. G. Hedahl - Kaiser Hill
A. K. Sieben - Kaiser Hill

[1] WBS # 1.1.03.08.04.OZ and Best Activity # IB 2310301

ADMIN RECORD
A-SW-002585

QUARTERLY REPORT

CONSOLIDATED WATER TREATMENT FACILITY AND OU7 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM

FOR JULY THROUGH SEPTEMBER 1996 INCLUDING DATA SUMMARY FOR APRIL THROUGH JUNE 1996

Rocky Mountain Remediation Services, L.L.C.

October 1996

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SECTION A - CONSOLIDATED WATER TREATMENT FACILITY

1.0 INTRODUCTION

The Consolidated Water Treatment Facility (CWTF) went on-line February 29, 1996. The CWTF is designed as a comprehensive facility combining individual IM/IRA treatment activities in order to reduce cost, increase efficiency, and offer treatment options to the Rocky Flats Environmental Technology Site (RFETS) in support of on-going Environmental Restoration (ER) activities and remediations. The following sections summarize the histories of the OU1 and OU2 treatment facilities, and the subsequent consolidation of these facilities into the CWTF.

1.1 HISTORICAL PERSPECTIVE - OU1

The Operable Unit No. 1 (OU1) Water Treatment Facility located in Building 891 began operation in April 1992. Building 891 has historically been used to treat the following waters:

- Groundwater collected from the 881 Hillside area (the French Drain Sump and the Collection Well)
- Water collected in the Building 881 Footing Drain (collection and treatment of this water was discontinued in September 1994)
- The majority of the water collected at the Main Decontamination Facility
- Some groundwater well purge water
- Rain water/snow melt pumped from the Building 891 Truck Dock and Tank Farm

Water from the French Drain Sump is piped directly to one of the Building 891 influent storage tanks each operating day. The depth of water level in the French Drain Sump typically regenerates from about a 1-foot low (after pumping) to 4-6 feet (over a one day period). The water from the Collection Well is pumped into a trailer-mounted container each operating day, and the container is then transported to Building 891 for off-loading and treatment.

The water from the French Drain Sump and from the Collection Well is temporarily stored in one of two influent collection tanks prior to treatment. The water is then treated with an ultraviolet (UV) light/hydrogen peroxide system for the removal of volatile organic compounds (VOCs), and a four-step ion exchange (IX) system for the removal of uranium, total dissolved solids, hardness, alkalinity, anions, and selected metals.

After treatment, the water is stored in one of three effluent storage tanks until laboratory sample results are received to verify that the water chemistry meets OU1 Applicable or Relevant and Appropriate Requirements (ARARs) and is acceptable for discharge into the South Interceptor Ditch (SID).

1.2 HISTORICAL PERSPECTIVE - OU2

The Operable Unit No. 2 (OU2) Field Treatability Unit (FTU) Granular Activated Carbon Treatment Units (located in trailer T-900C) began operation in May, 1991, and the Radionuclides Removal System (located in trailers T-900A and T-900B) began operation in April 1992. The FTU was historically used to treat the following waters:

- Surface water collected from Surface Water Stations SW-59, SW-61, and SW-132 (collection and treatment of water from SW-61 and SW-132 was discontinued on May 6, 1994)
- Some of the water collected at the Main Decontamination Facility
- Some groundwater well purge water
- Rainwater collected from FTU trailer containments
- Soil Vapor Extraction condensate water

Collected surface water was pumped directly from the surface water stations to Equalization Tank T-200 via a heat-traced pipeline. Collected surface water was stored in Equalization Tank T-200 until enough water was present to justify initiating a batch treatment. The water was then treated using pH adjustment, chemical precipitation, and cross-flow membrane filtration for the removal of radionuclides and metals, and GAC for the removal of VOCs. No effluent holding tank existed at OU2, and therefore treated effluent from the FTU was discharged directly to South Walnut Creek as it was processed (in accordance with the IM/IRA).

In May 1995, because heavy rains interrupted power at the SW-59 weir and may have compromised the integrity of the pipeline, it became necessary to collect and transport water from SW-59 using a trailer-mounted container. At the end of September 1996 new construction at the weir (double walled collection tank, influent and discharge piping, and associated electrical work) was complete. Water collected in the weir box is now pumped to this double-walled collection tank (T-59), and this water is transported to the CWTF approximately every three weeks via tanker truck.

The last process run for the OU2 FTU trailers at the OU2 location was August 8, 1995, and the final reading on the OU2 FTU totalizer was 24,856,900 gallons of water treated.

1.3 CONSOLIDATED WATER TREATMENT FACILITY

The Consolidated Water Treatment Facility (CWTF) consists of the following specific unit operations:

- Chemical precipitation (T-900A/T-900B)
- Cross-flow membrane microfiltration (T-900A/T-900B)
- Ultraviolet Light/Hydrogen Peroxide Oxidation (Building 891)
- Granular Activated Carbon (Building 891)[1]
- Ion Exchange (Building 891)

A portable clay absorbent media drum is also available for use at the CWTF during water transfers from tanker trucks to CWTF influent storage tanks as a pretreatment of oily wastewaters. Waters are processed through the various CWTF unit treatment operations based on knowledge of the influent water characteristics in order to maximize treatment and reduce handling costs and waste generation.

Highlights of the construction and subsequent operation of the CWTF are as follows:

- August 18, 1995: The OU2 trailers T-900A and T-900B were relocated to the south side of Building 891 (the T-900C GAC trailer was not relocated).
- September 18, 1995: The first day that OU2 SW-059 water, which is transported to the CWTF via trailer-mounted container, was treated in Building 891.
- October 17, 1995: The OU2 Equalization Tank T-200 was relocated to the southeast corner of Building 891.
- February 7, 1996: Acceptance at the CWTF of water from the emptying and cleaning of Tanks T-2 and T-40 (an ER Accelerated Action Project).
- February 27, 1996: Installation of the Granular Activated Carbon Unit in Building 891 complete.
- February 29, 1996: Treatment of Tank T-2 and Tank T-40 water through the OU2 trailers chemical precipitation/microfiltration system.

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[1] It was anticipated that the Consolidated Water Treatment Facility would also include cartridge filtration, however this project was canceled due to budget cuts.

- May 20, 1996: Acceptance of Ryan's Pit thermal desorption water for treatment and first use of the oil-absorbent media drum.
- May 28, 1996: Installation of new vent on Acid Tank T-209 complete.
- June 17, 1996: Acceptance of Trench T-3/T-4 thermal desorption water for treatment.
- June 26, 1996: First use of T-200 as a storage tank since its relocation from OU2.

The CWTF currently treats contaminated water from the following sources:

- OU1 groundwater and OU2 surface water
- Decontamination water from the Main and Protected Area Decontamination Facilities
- Other ER waters (e.g., purge water, water pumped from containments, etc.)
- Waters from ER Accelerated Action Projects

The CWTF flowpath is flexible enough to allow waters to be treated through particular unit processes as necessary, and to allow for re-treatment if necessary. The consolidation of the OU1 and OU2 water treatment facilities has reduced waste generation and significantly reduced direct operating costs.

2.0 CWTF OPERATIONS (APRIL, MAY, JUNE 1996)

2.1 QUANTITIES OF WATER COLLECTED AND TREATED

Table 2-1 summarizes the quantities of water treated at the CWTF for the period April through June 1996. During this period the CWTF accepted water from the following sources:

- OU1 French Drain Sump
- OU1 Collection Well
- OU2 Surface Water Station SW-59
- Snow melt/rain water pumped from CWTF containments.
- Ground water purge water
- Water from the thermal desorption of soil from Trench T-3/T-4.
- Water from the emptying of water from Tank #4 at IHSS 129.

As can be seen from Table 2-1, a total of approximately 109,829 gallons of water were treated through the Building 891 Ion Exchange Columns during the July through September period. Approximately 92,606 gallons of the total water volume were treated through the chemical precipitation/microfiltration trailers.

Please note that because the CWTF is equipped with three Influent Tanks, the amount of water treated may be less than or greater than the amount of water collected for any given period.

Two CWTF Effluent Storage Tank were released to the SID during the July through September 1996 period (refer to Table 3-4 for a listing of the most recent discharges from CWTF Effluent Storage Tanks).

As of the end of September 1996, approximately 3,548,817 gallons of water has been processed through the Building 891 Ion Exchange Columns.

2.2 CHEMICAL USAGE

The following chemicals are utilized during wastewater treatment operations at the CWTF:

- Building 891
  - Hydrogen peroxide (UV oxidation)
  - Hydrochloric acid (ion exchange regeneration and pH adjustment)
  - Sodium hydroxide (ion exchange regeneration)

- T-900A/T-900B trailers
  - Sulfuric acid (pH adjustment: TK-1 and effluent; filter module chemical cleaning)
  - Calcium hydroxide (precipitation)
  - Ferric sulfate (precipitation)
  - Hydrogen peroxide (chemical cleaning of filter modules)
  - Sodium hydroxide (pH adjustment: TK-2)
  - Sodium hypochlorite (chemical cleaning of filter modules)

Table 2-2 summarizes the quantities of chemicals utilized during the period of July through September 1996.

TABLE 2-1
CONSOLIDATED WATER TREATMENT FACILITY
APPROXIMATE QUANTITIES OF WATER COLLECTED AND PROCESSED a/

Month/Year	Gallons Collected from the OU1 French Drain Sump b/	Gallons Collected from the OU1 Collection Well b/	Gallons Accepted at Bldg 891 from the MDF and Other Sources c/	Gallons Pumped from Bldg. 891 Containments	Gallons Collected from the OU2 SW-59 d/	Gallons Processed through T900A/T900B e/	Gallons Processed through GAC at Bldg 891	Gallons Processed through IX at Bldg 891
Jan-96	20,590	1,400	4,500 f/	2,421	5,840	0	0	36,925
Feb-96	21,224	1,420	8203 g/ 528 h/	500	5,765	8,220	0	27,363
Mar-96	31,864	1,730	3,321 g/	8,046	5,680	0	12,418	45,598
1st Quarter Totals	73,678	4,550	16,552	10,967	17,285	8,220	12,418	109,886
Apr-96	36,924	2,035	5,200 i/ 7,596 g/	4,612	5,940	7,700	7,770	73,000
May-96	23,184	1,710	2535 i/ 650 g/ 6,973 j/	16,360	6,620	8,867	41,467	61,557
Jun-96	11,592	1,435	8,218 f/ 22,331 k/	2,685	6,215	21,785	27,254	54,724
2nd Quarter Totals	71,700	5,180	53,503	23,657	18,775	38,352	76,491	189,281
Jul-96	5,884	1,590	32,505 k/ 1,990 i/	8,051	6,090	44,290	58,732	56,167
Aug-96	3,184	1,430	17,027 k/ 17,233 l/ 200 i/	4,031	4,055	37,286	44,384	41,330
Sep-96	4,143	830	9,750 k/	11,223	2,950	11,030	18,662	12,332
3rd Quarter Totals	13,211	3,850	78,705	23,305	13,095	92,606	121,778	109,829
Year-to-Date Totals	158,589	13,580	148,760	57,929	49,155	139,178	210,687	408,996

a/ Please note that because the CWTF is equipped with Influent Tanks, the quantity of water collected will not necessarily equate to the quantity of water processed. Also note that a 15,000 gallon surge tank (T-203) is in-line between the UV/GAC unit processes and IX #1, and therefore the quantity of water processed through UV/GAC will not equate to the quantity of water processed through IX.

b/ This ground water is collected each operating day (i.e., 5 days per week).

c/ Other sources may include purge water, ER Accelerated Action Project water, etc.

d/ This surface water is collected daily (i.e., 7 days per week).

e/ The OU2 FTU trailers T-900A/T-900B were operated at the CWTF for the first time on February 29, 1996.

f/ This water was potable water which was used during the tightness testing of CWTF Influent Tank T-200.

g/ This water was from the emptying and cleaning of Tank T-2/Tank T-40(an ER Accelerated Action Project).

h/ This water was potable water used for OU2 trailer start-up/testing.

i/ This water was ground water purge water or water accepted from the MDF.

j/ This water was thermal desorption water from Ryan's Pit (an ER Accelerated Action Project).

k/ This water was thermal desorption water from Trench T-3 and Trench T-4 (an ER Accelerated Action Project).

l/ This water was from the emptying of water from Tank #4 at IHSS 129 (an ER Accelerated Action Project).

TABLE 2-2
CONSOLIDATED WATER TREATMENT FACILITY
CHEMICAL USAGE

	Building 891			T-900A/T-900B					
Month/Year	Hydrochloric Acid 36% (gallons)	Sodium Hydroxide 50% (gallons)	Hydrogen Peroxide 50% (gallons)	Sulfuric Acid a/ 98% (gallons)	Calcium Hydroxide (pounds)	Ferric Sulfate (pounds)	Hydrogen Peroxide 35% (gallons)	Sodium Hydroxide 50% (gallons)	Sodium Hypochlorite (gallons)
Jan-96	0.0	16.0	4.1	0.0	0.0	50.0	0.0	0.0	0.0
Feb-96	0.0	54.0	5.1	16.6	9.9	13.5	0.0	5.0	0.0
Mar-96	95.0	60.0	3.7	0.0	0.0	0.0	10.0	0.0	0.0
1st Quarter Totals	95.0	130.0	12.9	16.6	9.9	63.5	10.0	5.0	0.0
Apr-96	204.4	123.4	4.6	0.4	12.0	0.5	15.0	2.5	0.0
May-96	259.8	101.6	4.5	1.0	11.3	6.5	0.0	2.0	0.0
Jun-96	131.9	122.6	2.3	12.0	53.8	13.9	44.9	4.8	0.0
2nd Quarter Totals	596.1	347.6	11.4	13.4	77.1	20.9	59.9	9.3	0.0
Jul-96	210.6	152.8	9.2	13.7	275.9	19.5	24.8	8.4	0.0
Aug-96	391.8	193.0	0.4	12.3	215.9	17.5	31.3	4.5	0.0
Sep-96	0.0	0.0	2.8	3.8	50.0	7.5	15.0	1.0	0.0
3rd Quarter Totals	602.4	345.8	12.4	29.8	541.8	44.5	71.1	13.9	0.0
Year-to-Date Totals	1293.5	823.4	36.7	59.8	628.8	128.9	141.0	28.2	0.0

a/ In additon to the sulfuric acid quantity listed in this column, occasionally a small amount (approximately 1 gallon per effluent tank) of sulfuric acid is used in Building 891 for effluent pH adjustment.

2.3 WASTE GENERATION

The following types of waste are generated during normal wastewater treatment operations at Building 891 and the T-900A/T-900B trailers:

Building 891
- used filter socks
- neutralized ion exchange regenerant
- personnel protective equipment

T-900A/T-900B trailers
- filter press sludge cake
- personnel protective equipment
- used filter membranes

Table 2-3 summarizes the types and quantities of the waste generated during wastewater treatment operations at Building 891 and the T-900A/T-900B trailers for the first quarter of 1996. Approximately 20,305 gallons of neutralized regenerant water from Tank T-210 was sent to the 374 evaporator for processing during the July through September 1996 period.

TABLE 2-3
CONSOLIDATED WATER TREATMENT FACILITY
WASTE GENERATION

	Building 891			T-900A/T-900B		Bldg 891/T-900A/T-900B
Month/Year	Filter Socks (55-gal drum)	Neutralized Regenerant to 374 (gallons)	Spent GAC (pounds) a/	Sludge Production (55-gal drum)	Used Filter Membranes (55-gal drum)	Personal Protective Equip. (55-gal drum) b/
Jan-96	--	0	0	0	0	--
Feb-96	--	0	0	0	0	--
Mar-96	--	4,211	0	0	0	--
1st Quarter Totals	0 d/	4,211	0	0	0	2 drums c/,d/
Apr-96	--	9,326	0	0	0	--
May-96	--	2,670	0	0	0	--
Jun-96	--	4,361	0	0	0	--
2nd Quarter Totals	0 d/	16,357	0	0	0	2 drums c/,d/
Jul-96	--	8,986	0	0	0	--
Aug-96	--	6,920	0	0	0	--
Sep-96	--	4,399	0	0	0	--
3rd Quarter Totals	0 d/	20,305	0	0	0	2 drums c/,d/
Year-to-Date Totals	0	40,873	0	0	0	6

a/ A Granular Activated Carbon unit was installed in Building 891 in February 1996.

b/ PPE is monitored for radiological contaminants, and if determined to be acceptable for unrestricted release, is sent to the Rocky Flats landfill for disposal. Until the acceptance water from an ER Accelerated Action Project in February 1996, no PPE from Building 891 or the T-900A/T-900B trailers had been found to be radiologically contaminated.

c/ PPE is collected from water treatment operations, MDF decontamination operations, etc. and is drummed collectively.

d/ These drums are filled gradually, and therefore only quarterly totals are reported.

3.0 INFLUENT AND EFFLUENT SAMPLING (APRIL, MAY, JUNE 1996)

3.1 881 HILLSIDE GROUNDWATER CHARACTERISTICS

The 1992 French Drain Performance Monitoring Plan (FDPMP) requires monitoring of French Drain performance. The FDPMP requires groundwater level measurements of designated French Drain monitoring wells 4787, 4887, 10092, 10192, 10292, 10392, 10492, 10592, 10692, 10792, 10892, 10992, 11092, 31491, 35691, 39991, 45391[2]. Additionally, quarterly sampling of the wells is required.

Sixteen wells were removed from the site monitoring program at the beginning of the 1996 fiscal year. Further, due to the re-prioritization of site resources much of the data for wells which are still monitored are not yet available for the April through June 1996 period.

Table 3-1 presents a synopsis (as available) of the selected ground water monitoring well data for the following categories of constituents:

- VOCs
- Radionuclides
- Metals
- Water Quality

All constituents which exceeded OU1 ARARs are included in Table 3-1, however compounds which did not exceed OU1 ARARs are not necessarily included in the table. Note that it has historically been assumed that the OU1 ARARs for radionuclides and metals are dissolved values.

As can be seen from Table 3-1, during the January, February, March 1996 period those constituents which did exceed OU1 ARARs include the following:

GROUND WATER WELLS

Compound	Exceedance Range	Units	OU1 ARAR
Selenium	27.9 and 845	ug/L	10
Sulfate	282 and 284	mg/L	250
Total Dissolved Solids	1030 and 1710	mg/L	400

2 Well #39991 was reported as damaged in April 1993 and has been abandoned.

TABLE 3-1
CONSOLIDATED WATER TREATMENT FACILITY
COMPARISON OF SELECTED GROUND WATER WELL CONSTITUENTS TO OU1 ARARS
APRIL, MAY, JUNE MARCH 1996

			GROUND WATER WELLS		
			WELL 10492	WELL 10592	WELL 10692
	OU1		Bedrock	Alluvial	Alluvial
COMPOUND	ARAR	UNITS	10-Apr-96	16-Apr-96	10-Apr-96
1,1,1 Trichloroethane	200	ug/L	-- a/	--	--
1,1,2 Trichloroethane	5	ug/L	--	--	--
1,1 Dichloroethane	5	ug/L	--	--	--
1,1 Dichloroethene	7	ug/L	--	--	--
1,2 Dichloroethane	5	ug/L	--	--	--
Acetone	50	ug/L	--	--	--
Bromoform	NA b/	ug/L	--	--	--
Carbon Disulfide	5	ug/L	--	--	--
Carbon Tetrachloride	5	ug/L	--	--	--
Chloroform	NA	ug/L	--	--	--
Methylene Chloride	5	ug/L	--	--	--
Napthalene	NA	ug/L	--	--	--
Tetrachloroethene	5	ug/L	--	--	--
Toluene	2000	ug/L	--	--	--
Trichloroethene	5	ug/L	--	--	--
Trichlorofluoromethane	NA	ug/L	--	--	--
Gross Alpha c/	15	pCi/L	--	--	--
Gross Beta	50	pCi/L	--	--	--
Uranium	40	pCi/L	--	--	--
Copper (dissolved)	200	ug/L	--	--	--
Iron (dissolved)	300	ug/L	--		--
Lead (dissolved)	50	ug/L	--	--	--
Selenium (dissolved)	10	ug/L	845	--	27.9
Thallium (dissolved)	10	ug/L	--	--	--
Nitrate/Nitrite	10	mg/L	6	7.5	0.29
Sulfate	250	mg/L	284	--	262
Total Dissolved Solids	400	mg/L	1030	--	1710

a/ "--" = Data not currently available due to work re-prioritization.
b/ "NA" = No ARAR exists for this constituent.
c/ Note that this table does not include the error bounds on the radiological data.

3.2 OU1 FRENCH DRAIN SUMP, COLLECTION WELL, AND BUILDING 881 FOOTING DRAIN CHARACTERISTICS

Collection Well water is now collected separately from the French Drain Sump water, and collection and treatment of water from the Building 881 Footing Drain was discontinued in September 1994. Therefore the current French Drain Sump data is representative of only those waters that seep from the groundwater table into the French Drain. For the April, May, June 1996 period, quarterly sampling was performed at the French Drain Sump, the Collection Well, and the Building 881 Footing Drain.

Table 3-2 presents a synopsis of selected French Drain Sump, Collection Well, and Building 881 Footing Drain data for the following categories of constituents:

- VOCs
- Radionuclides
- Metals
- Water Quality

All constituents which exceeded OU1 ARARs are included in Table 3-2, however compounds which did not exceed OU1 ARARs are not necessarily included in the table. Note that it has historically been assumed that the OU1 ARARs for radionuclides and metals are dissolved values.

As can be seen in Table 3-2, samples taken from the French Drain Sump during the April through June 1996 period did not exceed OU1 VOC or radionuclide ARARs. Those constituents which did exceed OU1 ARARs include the following:

FRENCH DRAIN SUMP

Compound	Exceedance Range	Units	OU1 ARAR
Selenium (dissolved)	89.9	ug/L	10
Total Dissolved Solids	667	mg/L	400

Table 3-2 also presents a synopsis of Collection Well data for the April through June 1996 period. As can be seen in Table 3-2, samples taken from the Collection Well continue to contain elevated levels of VOCs. Those constituents which did exceed OU1 ARARs include the following:

COLLECTION WELL

Compound	Exceedance Range	Units	OU1 ARAR
1,1 Dichloroethene	24	ug/L	7
Carbon Tetrachloride	20	ug/L	5
Tetrachloroethene	67	ug/L	5
Trichloroethene	530	ug/L	5
Cadmium	30.2	ug/L	10
Lead	444	ug/L	50
Selenium	793	ug/L	10
Sulfate	252.95	mg/L	250
Total Dissolved Solids	1060	mg/L	400

Methylene chloride was detected at 4 ug/L which is below the OU1 ARAR of 5 ug/L. Chloroform was also detected Collection Well sampling, however this compound does not have an associated OU1 ARAR.

TABLE 3-2
CONSOLIDATED WATER TREATMENT FACILITY
COMPARISON OF SELECTED OU1 INFLUENT SOURCE CONSTITUENTS TO OU1 ARARS
APRIL, MAY, JUNE 1996

COMPOUND	OU1 ARAR	UNITS	FRENCH DRAIN SUMP 5-Jun-96	COLLECTION WELL 5-Jun-96	BLDG 881 FOOTING DRAIN 5-Jun-96	
1,1,1 Trichloroethane	200	ug/L	1 U a/	10	1 U	
1,1,2 Trichlorethane	5	ug/L	1 U	1 U	1 U	
1,1 Dichloroethane	5	ug/L	1 U	1 U	1 U	
1,1 Dichloroethene	7	ug/L	1 U	24 DJ	1 U	
1,2 Dichloroethane	5	ug/L	1 U	1 U	1 U	
Acetone	50	ug/L	5 U	5 U	--	
Benzene	NA b/	ug/L	1 U	1 U	1 U	
Benzoic Acid	NA	ug/L	-- c/	--	--	
Carbon Disulfide	5	ug/L	1 U	1 U	--	
Carbon Tetrachloride	5	ug/L	1 U	20	1 U	
Chloroform	NA	ug/L	1 U	1	1 U	
Methylene Chloride	5	ug/L	2	4	2 U	
Napthalene	NA	ug/L	--	--	1 U	
Tetrachloroethene	5	ug/L	0.3 J	67 D	35	
Toluene	2000	ug/L	1 U	1 U	1 U	
Trichloroethene	5	ug/L	0.3 J	530 D	3	
cis-1,2 Dichloroethene	NA	ug/L	--	--	3	
			Dissolved	**Dissolved**	**Total**	**Dissolved**
Gross Alpha d/	15	pCi/L	4.28	7.43	7	8
Gross Beta	50	pCi/L	4.21	8.99	5	5
Plutonium	15	pCi/L	0.00208	0.000559	--	--
Uranium, total	40	pCi/L	10.997	23.031	8.534	8.268
Aluminum	200	ug/L	30.6 B	26.4 B	57.3 B	20.9 B
Arsenic	50	ug/L	121 U e/	121 U e/	121 U	121 U e/
Cadmium	10	ug/L	7.3	30.2	3.0 U	3.7 B
Calcium	NS	ug/L	125000	183000	95700	102000
Copper	200	ug/L	4.1 B	3.0 U	3.0 U	3.0 U
Iron	300	ug/L	10.0 U	16.3 B	27.7 B	10.0 U
Lead	50	ug/L	45.7 B	444	34.0 U	98.5 B f/
Magnesium	NS	ug/L	31900	38600	21800	23200
Manganese	50	ug/L	1.0 U	6.1 B	3.2 B	2.7 B
Potassium	NS	ug/L	2080 B	1060 B	3490 B	3370
Selenium	10	ug/L	89.9 B	793	43.0 U e/	43.0 U e/
Thallium	10	ug/L	--	--	--	--
Zinc	2000	ug/L	81.4	3.3 B	53.7	17.1 B
Hardness (as CaCO3: Ca and Mg)	NA	mg/L	443	616	329	350 f/
Chloride	250	mg/L	78.10	190.70	52.60	
Nitrite/Nitrate	10	mg/L	1.25	5.65	6.85	
Sulfate	250	mg/L	129.60	252.95	21.95	
Total Dissolved Solids	400	mg/L	667	1060	491	

a/ Refer to Appendix A for an explanation of the data qualifiers.
b/ "NA" = No ARAR exists for this constituent.
c/ "--" = Data not available.
d/ Note that this table does not include the error bound on the radiological data.
e/ Note that although this result is non-detect, the detection limit is greater than the OU1 ARAR.
f/ Note that this data is suspect because the dissolved concentration is greater than the total concentration.

As can be seen in Table 3-2, samples taken from the Building 881 Footing Drain collected during the April through June 1996 period exceeded OU1 ARARs as follows:

BUILDING 881 FOOTING DRAIN

Compound	Exceedance Range	Units	OU1 ARAR
Tetrachloroethene	35	ug/L	5
Lead	98.5 (dissolved)	ug/L	50
Total Dissolved Solids	491	mg/L	400

The Building 881 Footing Drain is currently being sampled for both total and dissolved radionuclides and metals (refer to DOE letter ER:SRG:10199, dated September 29, 1994).

3.3 OU2 SURFACE WATER CHARACTERISTICS

Surface water is sampled on a quarterly basis from SW-59, SW-61, and SW-132. Although the Environmental Protection Agency and the Colorado Department of Public Health and the Environment authorized the discontinuation of the collection and treatment of SW-61 and SW-132 on April 24, 1994, the two surface water stations continue to be sampled to verify that no increase in contamination is occurring. Collection and treatment for SW-61 and SW-132 was discontinued on May 6, 1994. Presently only SW-59 water is collected and treated. Note that it has historically been assumed that the OU2 ARARs for radionuclides and metals are total values.

Table 3-3 presents a synopsis of OU2 Surface Water data for the April through June 1996 period. As can be seen in the table, those constituents which did exceed OU2 ARARs include the following:

SURFACE WATER STATIONS: SW-59, SW-61, and SW-132

Compound	Stations	Exceedance Range	Units	OU2 ARAR
Carbon Tetrachloride	SW-59, SW-61	40 and 7	ug/L	5
Chloroform	SW-59	12	ug/L	1
Tetrachloroethene	SW-59, SW-61	20 and 12	ug/L	1
Trichloroethene	SW-59, SW-61	29 and 13	ug/L	5
Vinyl Chloride	SW-61	6	ug/L	2
Americium	SW-61	0.053	pCi/L	0.05
Plutonium	SW-61	0.051	pCi/L	0.05
Aluminum (total)	SW-59	234	ug/L	200
Zinc	SW-59, SW-61, SW-132	197, 193 and 175	ug/L	50

Other compounds, such as 1,1,1-Trichloroethane, 1,1-Dichloroethane, and cis-1,2-Dichloroethene were also identified during the sampling at 3 ug/L, 2 ug/L, and approximately 20 ug/L respectively, however these constituents do not have associated OU2 ARARs.

TABLE 3-3
CONSOLIDATED WATER TREATMENT FACILITY
COMPARISON OF SELECTED SW-59, SW-61 AND SW-132 CONSTITUENTS TO OU2 ARARS
APRIL, MAY, JUNE 1996

COMPOUND	OU2 ARARs	Units	SW-59 30-May-96	SW-61 30-May-96	SW-132 30-May-96
1,1,1-Trichloroethane	NA a/	ug/L	3	3	1.0 U b/
1,1-Dichloroethane	NA	ug/L	1.0 U	2	1.0 U
1,1-Dichloroethene	7	ug/L	2	1.0 U	1.0 U
1,2-Dichloroethane	NA	ug/L	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	5	ug/L	40	7	1.0 U
Chloroform	1	ug/L	12	1	1.0 U
Methylene Chloride	NA	ug/L	1.0 U	1.0 U	1.0 U
Tetrachloroethene	1	ug/L	20	12	1.0 U
Trichloroethene	5	ug/L	29	13	1.0 U
Vinyl Chloride	2	ug/L	1.0 U	6	1.0 U
cis-1,2-Dichloroethene	NA	ug/L	17	24	2
Americium c/	0.05	pCi/L	0.047	0.053	0.036
Gross Alpha	11	pCi/L	7	6	7
Gross Beta	19	pCi/L	1	8	5
Plutonium- 239/240	0.05	pCi/L	0.044	0.051	0.019
Uranium	10	pCi/L	7.22	6.53	4.60
Aluminum	200	ug/L	234	166 B	150 B
Calcium	NS	ug/L	104000	89000	48800
Copper	25	ug/L	8.4 B	8.2 B	7.4 B
Iron (dissolved)	300	ug/L	-- d/	--	--
Iron	1000	ug/L	207	329	194
Lead	5	ug/L	34.0 U e/	34.0 U e/	34.0 U e/
Magnesium	NS	ug/L	32100	14700	12100
Manganese	1000	ug/L	146	76.6	15.5
Manganese (dissolved)	50	ug/L	--	--	--
Potassium	NS	ug/L	772 B	6350	3850
Selenium	10	ug/L	43.0 U e/	43.0 U e/	43.0 U e/
Silicon	NS	ug/L	5910	4440	3830
Sodium	NS	ug/L	38800	41400	39400
Zinc	50	ug/L	197	193	175
Total Dissolved Solids (TDS)	NS	mg/L	--	--	--
Chloride	NS	mg/L	--	--	--
Sulfate	NS	mg/L	--	--	--
Hardness (as CaCO3: Ca and Mg)	NA	mg/L	392	283	172

a/ "NA" = No ARAR exists for this constituent.
b/ Refer to Appendix A for an explanation of the data qualifiers.
c/ Note that this table does not include the error bounds on the radiological data.
d/ "--" = Data not available or not sampled.
e/ Although this data is non-detect, the detection limit is higher than the OU2 ARAR.

3.4 TREATED EFFLUENT CHARACTERISTICS

Treated effluent from the CWTF is stored in one of three Effluent Storage Tanks prior to discharge. An Effluent Storage Tank is sampled once it is full, and the tank is discharged if the data show that ARARs have not been exceeded. Table 3-4 presents a synopsis of selected effluent tank data for July through September 1996 (Note that not all analyzed compounds are presented on Table 3-4).

The Effluent Storage Tanks discharged in July 1996 contained treated water from OU1 and OU2 influent sources, purge water, MDF water, snow melt pumped from CWTF containments, and two ER Accelerated Action Projects.

The last column of Table 3-4 also presents a list of the proposed RFCA Segment 5 Action Levels for analytes which are parallel to the OU1/OU2 ARARs. This column has been included to show that difficulties will develop when the RFCA list is actually implemented. The following is a list of general concerns:

- Under RFCA the metals standards are a mixture of dissolved, total, and total recoverable standards which will increase the sampling and analysis cost for compliance points.

- Some of the RFCA metal standard concentrations may not be practically achievable, as shown by the boxed constituents in the last column of Table 3-4. For instance, the RFCA Segment 5 action level for cadmium is 1.5 ug/L (dissolved), however under the General Radiochemistry and Routine Analytical Services Protocol (GRRASP) laboratories have a Contract Required Detection Limits (CRDL) for cadmium of 5 ug/L (see also antimony, mercury, and silver).

TABLE 3-4
CONSOLIDATED WATER TREATMENT FACILITY
COMPARISON OF SELECTED EFFLUENT STORAGE TANK DATA TO OU1/OU2 ARARS
JULY, AUGUST, SEPTEMBER 1996

				CWTF Effluent Tanks a/					
				Tank No. : T-206		T-207			RFCA Segment 5
	OU1	OU2		Sampled : 5/30/96		6/13/96			Analytes Parallel
COMPOUND	ARARs	ARARs	UNITS	Discharged : 7/18/96		7/22/96			to OU1/OU2
VOLATILES									
1,1,1-Trichloroethane	200	NS b/	ug/L	1	U c/	1	U		200.00
1,1,2-Trichloroethane	5	NS	ug/L	1	U	1	U		5.00
1,1-Dichloroethane	5	NS	ug/L	1	U	1	U		1010.00
1,1-Dichloroethene	7	7	ug/L	1	U	1	U		7.00
1,2-Dichloroethane	5	NS	ug/L	1	U	1	U		5.00
Acetone	50	NS	ug/L	5	U	3	BJ		3650.00
Carbon disulfide	5	NS	ug/L	1	U	1	U		27.60
Carbon tetrachloride	5	5	ug/L	1	U	1	U		5.00
Chloroethane	NA	NA	ug/L	1.0	U	1	U		27800
Chloroform	NA	1	ug/L	0.4	J	0.4	J		6.00
Chloromethane	NA	NA	ug/L	0.3	J	1			2.32
Methylene chloride	5	NS	ug/L	0.6	BJ	3			5.00
Tetrachloroethene	5	1	ug/L	1	U	1	U		5.00
Toluene	2000	NS	ug/L	1	U	1	U		1000.00
Trichloroethene (TCE)	5	5	ug/L	1	U	1	U		5.00
Vinyl chloride	NA	2	ug/L	1	U	1	U		2.00
Xylene (total)	NA	NA	ug/L	1	U	0.6	J		10000
SEMI-VOLATILES									
Diethylphthalate	NA	NA	ug/L	10	U	1	BJ		29200
Di-n-Butylphthalate	NA	NA	ug/L	8	BJ	1	J		3650
Butylbenzylphthalate	NA	NA	ug/L	1	BJ	10	U		3000
bis(2-Ethylhexyl)phthalate	NA	NA	ug/L	1	BJ	10	U		6.00
RADIONUCLIDES d/				Total		Total			Woman Creek
Americium 241	4	0.05	pCi/L	0.007		0.0023			0.15 T
Gross Alpha	15	11	pCi/L	0.2		-0.155			11.00 T
Gross Beta	50	19	pCi/L	-0.3		0.518			19.00 T
Plutonium 238/239/240	15	0.05	pCi/L	0.001		-0.001			0.15 T
Radium 226 and 228	NS	NS	pCi/L	--	e/	--			5.00 T
Strontium 89/90	8	NS	pCi/L	-0.153		0.0171			8.00 T
Tritium	20000	NS	pCi/L	170		280			500.00
Uranium	40	10	pCi/L	0.079		0.182			10.00 T
METALS f/				Total		Total		Dissolved	
Aluminum	5000	200	ug/L	53.2	U	53.2	U	53.2 U	87.00 D
Antimony	60	NS	ug/L	34.6	U	34.6	U	34.6 U	6.00 TR g/
Arsenic	50	50	ug/L	2.0	U	2.0	U	2.1 B	50.00 TR
Barium	1000	1000	ug/L	63.6	B	29.7	B	16.6 B	1000.00 TR
Beryllium	100	100	ug/L	0.52	B	0.50	B	0.50 B	4.00 TR
Boron	NS	NS	ug/L	--		--		--	750.00 T
Cadmium	10	10	ug/L	2.4	U	2.4	U	2.4 U	1.50 D
Calcium	NS	NS	ug/L	4010	B	4080	B	3790 B	NS
Chromium (total)	NS	NS	ug/L	4.1	U	4.1	U	4.1 U	NS
Chromium III	50	10	ug/L	--		--		--	50.00 TR
Chromium VI	50	10	ug/L	--		--		--	11.00 D
Copper	200	25	ug/L	19.1	B	19.6	B	24.6 B	16.00 D
Iron (dissolved)	300	300	ug/L	--		--		33.9 B	NS
Iron (total)	1000	1000	ug/L	55.4	B	53.8	B	--	1000.00 TR
Lead	50	5	ug/L	0.60	U	0.60	U	0.60 U	6500.00 D
Lithium	2500	NS	ug/L	14.3	B	17.8	B	16.3 B	NS
Magnesium	NS	NS	ug/L	1630	B	1080	B	1060 B	NS
Manganese (dissolved)	50	50	ug/L	--		--		2.1 B	NS
Manganese (total)	NS	1000	ug/L	2.6	B	2.5	B	--	1000.00 TR
Mercury	2	0.2	ug/L	0.10	U	0.10	U	0.10 U	0.01 T
Molybdenum	100	NS	ug/L	9.1	U	9.1	U	9.1 U	NS
Nickel	200	40	ug/L	9.1	U	9.1	U	9.1 U	123.00 D
Potassium	NS	NS	ug/L	3110	B	1850	B	1820 U	NS
Selenium	10	10	ug/L	1.5	U	1.5	U	1.5 U	5.00 D
Silver	50	NS	ug/L	5.9	U	5.9	U	5.9 U	0.60 D
Sodium	NS	NS	ug/L	12300		19500		20100	NS
Strontium	NS	NS	ug/L	28.6	B	24.1	B	23.3 B	NS
Thallium	10	NS	ug/L	3.3	B	3.1	U	3.1 U	NS
Tin	NS	NS	ug/L	27.2	B	27.2	U	27.2 U	NS
Vanadium	100	NS	ug/L	5.7	U	5.7	U	5.7 U	NS
Zinc	2000	50	ug/L	49.8		42.8		50.5	141.00 D
WATER QUALITY									
Hardness (as CaCO3: Ca and Mg)	NS	NS	mg/L	16.7		14.6			NS
Chloride	250	NS	mg/L	7.78		23.5			NS
Fluoride	NS	NS	mg/L	0.355		0.315			2.00
Nitrate + Nitrite	NS	NS	mg/L	0.268		0.627			NS
Nitrate	10	NS	mg/L	--		--			10.00
Nitrite	1	NS	mg/L	--		--			4.50
Sulfate	250	NS	mg/L	7.56		7.08			NS
Sulfide (as H2S)	NS	NS	mg/L	--		--			0.002
Total Dissolved Solids (TDS)	400	NS	mg/L	65		92.0			NS
pH	6.5-9.0	NS	S.U	7.31		7.69			6.5 - 9.0
Dissolved Oxygen (minimum)	NS	NS	mg/L	--		--			5.0

a/ Data presented in this table is taken from faxes sent by the laboratories.
b/ "NS" = No Standard.
c/ Refer to Appendix A for an explanation of the data qualifiers.
d/ Note that this table does not include the error bounds on the radiological data.
e/ "--" = This data is not available.
f/ Historically it has been assumed that OU1 radionuclide and metal ARARs were dissolved concentrations, and that OU2 rad and metal ARARs were total concentrations
g/ Particular RFCA Action Levels have been highlighted because the concentration of the RFCA Action Level is either less than the GRRASP contractual level or is not achievable from a practical standpoint (Refer to July 19, 1996 RFCA Surface Water Action Levels & Stamdards).

4.0 ENVIRONMENTAL COMPLIANCE

Periods of Non-Collection: OU2 SW-59

There was one period of non-collection at the OU2 SW-59 weir during the July, August, September 1996 period as follows:

On August 21, 1996 it was discovered that the secondary main breaker at the SW-59 transformer was in the OFF position. It was determined that the breaker had been in the OFF position for about 20 hours, and that approximately 150 gallons was not collected. The breaker was immediately reset and appropriate notifications were made.

5.0 ANTICIPATED OPERATIONS FOR NEXT QUARTER

Collection and treatment of water from the French Drain Sump will continue as normal. Water from the Collection Well will continue to be collected in the OU1 trailer-mounted container and transported to the CWTF for off-loading and treatment. Purge, incidental, and decontamination pad waters will continue to be accepted and treated.

Collection of SW-59 weir water into T-59 (the double-walled tank located just south of the SW-59 weir box) began on September 30, 1996. This collected water is now periodically transported to the CWTF via tanker truck. Note that if trucking is overly busy, it may occasionally be necessary to transfer weir water using the trailer-mounted container.

The CWTF will continue to accept and treat waters from ER Accelerated Action Projects.

The process flowpath for the water to be treated is chosen based upon the influent contaminants and best anticipated method of treatment. Efforts will be made to minimize waste generation during CWTF operations.

SECTION B - OU7 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM

6.0 INTRODUCTION, OPERATIONS, AND SAMPLING

The OU7 Passive Seep Interception and Treatment System (PSITS) is designed to collect and treat OU7 seep water and thereby eliminate, to the extent practicable, the discharge of the FO39-listed waste contained in this seep water to the East Landfill Pond. The collection and treatment system is comprised of the following items:

- A seep interception system.
- A settling basin to remove total suspended solids.
- A biocide (hydrogen peroxide) addition system.
- A bag filtration system consisting of two filters operated in parallel (currently 25 micron bags are in use in the system).
- One or two 55-gallon drums of granular activated carbon (GAC) to remove volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs). When two GAC drums are in use, the drums are operated in series in lead and lag positions.

Obtaining and maintaining smooth operation of the OU7 PSITS has been challenging due to the rapid build-up of sediments in the filter socks, air-binding of the system due to the addition of hydrogen peroxide, the small system head differential, and occasionally increased flow to the system due to storm events and seasonal variations. Since the beginning of June 1996, hydrogen peroxide has not been added to the system in an attempt to eliminate the persistent air-binding problem.

Highlights of the construction and subsequent operation of the OU7 PSITS are as follows:

June 27, 1995:	CDPHE and EPA approves the Modified OU7 Passive Seep Collection and Treatment PAM dated March 1996.
December 6, 1995:	Construction of the OU7 PSITS began.
February 21, 1996:	OU7 PSITS system shake-down began.
February 24 & 25, 1996:	Settling basin pumped down.
February 26, 1996:	OU7 PSITS by-passed due to operational problems (see above).
April 30, 1996:	OU7 PSITS operational with one GAC drum and two filter socks in use.
May 5, 1996:	Settling basin pumped down to below high-level alarm set-point.
May 8, 1996:	Air vents added to filters and GAC drums to allow relief of bound air.
May 15, 1996:	Hydrogen peroxide storage tank wrapped with reflective sheet to prevent ultraviolet (UV) rays from degrading the hydrogen peroxide.
May 22, 1996:	Settling basin pumped down.
May 26, 1996:	By-pass line installed at 26" below the top of the settling basin to allow for by-pass during maintenance activities or during periods of high flow. Some water by-passing.
May 28, 1996:	Water, at approximately 2 gallons per minute, was by-passing the system due to heavy rains. Filter socks changed-out and different GAC put on-line.
June 6, 1996:	By-pass line modified to include a "wet-well" for use in measuring settling basin water level.
June 13, 1996:	Tank sump fitting grouted.
June 26, 1996:	Guard rail added around tank vault, and steel lid replaced by a lighter lid.
July, 24, 1996:	Virgin GAC loaded into existing GAC drums and the two GAC drums brought on-line.

September 13, 1996:	Filter socks changed out.
September 14, 1996:	A corrosion pin-hole was discoverd in one of the GAC drums and this drum was taken off-line. Only one GAC drum operational until replacement drum can be procured, shipped, and installed.
October 16, 1996:	Two GAC drums back on-line.

One GAC effluent sample (an outfall sample) was taken during the third quarter of 1996 (7/15/96), and the results of this sample are shown in Table 6-1. Based on the vinyl chloride effluent concentration of 5 ug/L, which is above the RFCA Segment 4a & 4b Standard of 2 ug/L, the OU7 GAC was changed out on July 24, 1996 and two GAC canisters were brought on-line.

A lead GAC sample and an outfall sample were then taken on September 13, 1995 (the day before the corrosion pin-hole was discovered). This data is not yet available from the laboratory.

The effectiveness of GAC drum series operation will continue to monitored. EPA will be notified immediately in any instance where by-pass continues longer than 72 hours.

TABLE 6-1
OU7 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM
COMPARISON OF SELECTED OU7 CONSTITUENTS TO RFCA SEGMENT 4a & 4b STANDARDS
JULY, AUGUST, SEPTEMBER 1996 a/

Constituents b/	Location Code: SW00196 (OU7 OUTFALL) Sample Date: 7/15/96 Sample Number: SW70503RG Units: (ug/L)	RFCA Segment 4a & 4b (ug/L)	RFCA PQLs c/ (ug/L)
VOLATILES			
1,1-Dichloroethane	9	--	1.00
1,2-Dichloroethene	1 (cis&trans) U	70.00 (cis)	5.00
2-Butanone (MEK)	2 J	--	--
2-Hexanone (MBK)	5 U	--	--
4-Methyl-2-Pentanone	-- d/	--	--
Acetone	5 U	--	--
Benzene	1 U	1.00	1.00
Carbon Disulfide	1 U	--	--
Chloroethane	23	--	--
Chloromethane	1 U	5.70	--
Ethylbenzene	2	680.00	10.00
Methylene chloride	1	5.00	--
o-Xylene	1 U	--	--
Tetrachloroethene	1 U	0.80	**1.00**
Toluene	1 U	1,000.00	5.00
Trichloroethene	1 U	2.70	1.00
Vinyl Acetate	--	--	--
Vinyl Chloride	5	2.00	2.00
Xylene (total)	1 (m&p) U	10,000.00	5.00
TICS	--	--	--
SEMI-VOLATILES			
2,4-Dimethylphenol	--	540.00	50.00
2-Methylnaphthalene	--	--	--
4-Methylphenol	--	--	--
Acenapthene	--	520.00	10.00
bis(2-ethylhexyl)phthalate	--	1.80	**6.00**
Butylbenzylphthalate	--	3,000.00	10.00
Dibenzofuran	--	--	--
Diethylphthalate	--	23,000.00	10.00
Di-n-butylphthalate	--	2.70	**10.00**
Fluorene	--	1,300.00	10.00
Naphthalene	--	620.00	10.00
Phenanthrene	--	0.0028	**10.00**
Phenol	--	2,560.00	50.00
TICS	--	--	--

a/ Note that outfall and lead GAC samples were taken on 9/13/96 however this data is not yet available.

b/ This list is comprised of the VOC and SVOC constituents found in Appendix A of the Passive Seep Interception and Treatment OU7 Modified PAM dated March 1996, and constituents identified in the 5-29-96 sample.

c/ Whenever the practical quantitation limit (PQL) for a pollutant is higher (less stringent) than a standard and/or action level, "less than" the PQL shall be used as the compliance threshold. These less stringent PQLs are bolded.

d/ "--" = Data not available.

Appendix A
Data Qualifiers and Descriptions

Selected Laboratory Data Qualifiers and Descriptions

Qualifier	Description
B	< method detection limit but >= instrument detection limit (INORGANIC)
B	Analyte found in blank and sample (ORGANIC)
D	Compound identified using secondary dilution factor (ORGANIC)
E	Concentration exceeds calibration range of instrument (ORGANIC)
E	Estimated due to interference (INORGANIC)
J	Estimated value, < sample's detection limit
N	Spiked recovery not within control limits (INORGANIC)
S	Determined by MSA (INORGANIC)
U	Undetected, analyzed for but not detected
W	Post-digest sample outside of control limit (INORGANIC)

Selected Data Validation Qualifiers and Descriptions

Qualifier	Description
A	Data is acceptable, with qualifications
JA	Estimated, acceptable
R	Data is rejected
V	Data is valid
Y	Analytical results in validation process
Z	Validation was not requested or performed